



# **Education Management and Information System**

Capacity Building and Information Use,  
State of Kano, Nigeria

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# **Education Management and Information System**

Capacity Building and Information Use

State of Kano, Nigeria

Final Report

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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.



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# Introduction

In December 2004, USAID approved a six month extension to the Kano Education Management Information System activity in order to refine and further develop the existing information database, to strengthen SPEB capacity to manage and use data and information and to sustain progress in creating demand for data and information. The objectives for the extension period are four-fold: (i) to ensure that the information database provides a flexible and intuitive interface that meets the demands of the client for a wide range of reporting needs; (ii) to provide the SPEB with the capacity to perform data integration and export tasks to meet external data demands (Federal requests, for example) and provide a range of criteria to identify external capacity to make fundamental alterations to the database in the future as needed; (iii) to consolidate and reinforce the capacity of SPEB to manage data both internally and externally recognizing that developing this capacity is a long term process; and (iv) to support the SPEB-led initiative to promote a devolved demand for information at the LG and school level.

This report uses the structure of the extension proposal as its base and refers to activities and outputs identified in that proposal. For simplicity of reading, the report focuses on these objectives, and obstacles encountered. Please refer to Annex 1 for progress in meeting deliverables.

## Refine and further develop the information system

1. In response to the demand for an improved interface, the EMIS database developed during 2004 was adapted and enhanced in three areas:

### ***Expanded reporting capabilities.***

2. Crystal Reports development package and licensing was purchased and installed on the Kano server. Crystal Reports provides the non-programmer with the means to create and modify reports, in a well structured, formatted way. These reports print well, and are readily exported to formats such as MS Excel, MS Word, and PDF. Similarly, the standard Crystal Reports web interface allows for rapid deployment of reports onto the web interface with no additional coding. If it is desired, this interface can be customized, and used with the existing reports.
3. In April 2005, STTA was supplied to train ICT staff in the design and modification of Crystal Reports. As a result of the training, 3 information staff members can generate reports as needed, and add them to the KEMIS interface on an as needed basis. A further 2 can manipulate existing reports for presentation,
4. The standard reports developed in 2004, have been revised to improve the presentation and the content. With the new database, reports at the State, zone and local government can
  - a. Be disaggregated by type of school (secular – or full medium, Islamiyya and Quranic)

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- b. Be disaggregated by class of school (public or private) and this can be applied to type of school, such that a report can present information for all private Islamiyya schools, for example.
    - c. Allow for comparison with the previous year. Because of significant coverage differences between 2004 and 2005 data, this function has limited utility under the current data, but will allow meaningful year on year comparison in future years.
    - d. Select best and worst schools or local governments for certain indicators, such as pupil teacher ratio, pupil class ratio and pupil seat ratio. This selection can be cascaded by year, allowing year on year comparison.
    - e. allow a school to compare its status to the previous year across a variety of indicators including pupil seat ratio, pupil classroom ratio and pupil teacher ratio. The report has also been created in grey-scale to reduce the costs of printing without detracting from report presentation.
  5. In addition to improved report presentation, the calculation of indicators has also been improved. As a result of the census questionnaire capturing information by shift, the pupil class and pupil seat ratios were modified to ensure that facilities used by multiple shifts were counted as available for both shifts – thus more accurately reflecting the facility and material needs for a particular institution. In addition, classroom facilities were more easily categorized, allowing calculations on the basis of useable rather than reported classrooms. Similarly, the allocation of latrines by user (male and female, teacher, pupil or both) allows for a more in depth analysis of toilet facility availability.
  6. Significant changes were made to the user interface to enable easier navigation of the system and facilitate data entry. In particular, the following features were added:
    - a. “find questionnaire” allows easy movement between the different forms on a particular census;
    - b. In the left-hand window of the user interface, “select school”, “select questionnaire” and “select LGEA” buttons have been added and the user is taken to these query screen within the same window;
    - c. schools have been “hyper-linked” to their records so that clicking on a school name in the list of schools opens a window in the same frame with all the questionnaires for that school.

### ***Revision and changes to the census questionnaire and addition of new fields***

7. 2005 Census Questionnaire revised based on stakeholder input. In January/February, short term technical assistance was provided to facilitate the revision of the annual census questionnaire. Workshops were held with stakeholders on 25 and 26 January at SPEB headquarters, led by the Deputy Director Statistics (PRS), the USAID Desk Officer, and the consultant (Herstein). Participants included SPEB Zonal coordinators, LGEA Education Secretaries, LGEA Statistics officers, NUT representatives, and PTA chairmen. During these consultations, participants (i) examined the 2003/2004 education census questionnaire and suggested additional changes and format revisions; (ii)

identified problems encountered in completing the questionnaire and provided advice for a “guide”; and (iii) agreed on a schedule of activities for implementation of the 2004/2005 annual census.

8. With this feedback and including questions from the federal census questionnaire, the census form was revised and a completion guide in both Hausa and English was developed. This revised questionnaire and guide were tested in a cross-section of public, private, nomadic, secular, and Islamiyya schools and based on the feedback, revised again.
9. Database interface modified to reflect census questionnaire changes. This revised questionnaire was sent to the database programmer who then revised the underlying code and the HTML format for the data entry interface. This process was more complicated than anticipated in the extension proposal because (i) significant formatting changes were made to the questionnaire to more closely reflect the National Census instrument (reversing columns and rows in tables, for example); (ii) a large number of additional questions were added to the 2003/2004 questionnaire in response to request of stakeholders; and (iii) existing questions were expanded to reflect the need for clarity imposed by the census completion guide. In addition, new code was written and the underlying database structure was revised to accommodate multiple year reporting. Whilst the impact of stakeholder participation created complexity for the software revision, it demonstrates a more participatory and interested response in the data and its presentation from the various stakeholders.
10. A set of Standard Operating Procedures for Kano SPEB’s data collection and management process was drafted in February 2005. These guidelines and tools are meant to ensure that
  - adequate preparation is made each year for data collection and management
  - data is verified multiple times during the process
  - paper forms are tracked and stored properly.
11. The annual census was undertaken on two days, February 9th and 14th. Initially programmed to coincide with the National census collection, two problems arose that affected initial implementation: (i) the National census forms arrived late to Kano, preventing distribution to the LGEAs, via the District offices; (ii) the Government declared a public holiday the eve of the census collection. As a result, the SPEB arranged for the census to take place exactly one week later. Unfortunately, some schools were already mobilized and collected State census data. Even with this unanticipated problem, over 3,864 schools returned a form (compared with 3,000 last year). This reflects the participation of private sector schools in the census. In addition, SPEB decided to send to every public school copies of the 2003/2004 school indicator reports developed by EMIS. SPEB encouraged schools to look at the reports, verify the information and ensure 2004/2005 census returns were consistent. This was well received by school head teachers and PTA members, who conveyed that it helped to verify the information

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they supplied. Some schools, during data verification process, also confirmed that they used the reports to evaluate their school. The project subsidized the costs of paper and toner for these school reports.

12. Logical Consistency checks incorporated. To identify possible inconsistencies in completing questionnaires during data entry and to facilitate data verification and data updating, logical consistency checks will have been written into the database programming. These checks include:
  - a. graying out afternoon shift questions if the school was entered as morning shift only
  - b. preventing data of first appointment for teachers being below the age of 18;
  - c. making certain cells numeric only
  - d. automatically allocating teachers assigned as “in full time training” or “on secondment” to the appropriate data entry form.
13. The testing of the revised database structure and logical consistency checks took place from March 15 to April 1, 2005. A number of technical difficulties were experienced with this process. First, the UPS protecting the server stopped functioning. Without protection, the server was subjected to frequent power outages. These in turn affected the software, shutting down the server abruptly before processing of some operations could be completed. It was discovered subsequently that during one of the power surges, a part of the script that allocates data from the user interface to the database was lost. The result was that over 600 schools that had been entered, and recorded as entered had no assigned information in the database. RTI is resolving this problem, using its own funds, during the month of July after the project close-out date. Second, the internet service provider continued to provide unreliable service to the end of project, preventing remote installation of large files. Third, a number of public holidays (Easter, plus some Kano specific holidays), took place during the database testing period in March. These factors combined led to a delay in the full installation of the revised database, data validation and data entry formats beyond the end of March, delaying the start of data entry by more than two weeks.
14. Data verification. In April 2005, the SPEB conducted a three week data verification exercise in which SPEB staff visited 4 schools from each LG with the sample being randomly stratified to reflect the distribution of Islamiyya, secular, and Qu’ranic schools. The staff carried the original forms completed by the schools and were instructed to compare the information on the form with the school situation. Head counts of children and teachers were conducted and records checked. Findings from the verification were:
  - a. There was less than 3% discrepancy in enrollment information, facilities and classroom infrastructure data
  - b. In 13 schools across two rural zones there were significant discrepancies in recording attendance. This was attributed to the lack of attendance registers in the schools.
  - c. Very few schools (fewer than 20 of the 176 schools sampled) had admission registers with pupil birth dates recorded. Therefore data for B1 (enrollment by age) was considered to be unreliable.



- d. In 5 schools data on the status of teachers was incorrectly recorded (ie not correctly allocated by training or secondment)
  - e. In conclusion, the data was considered to be reliable. No changes were made in the calculations to accommodate for discrepancies.
15. Data Validation. During data entry, a questionnaire from each data entry operator was sampled daily to ensure entered data reflected the census forms. Reported data entry errors were negligible.

### ***Extension of the database and integration of external data***

16. Include State Common Entrance Exam scores. Discussions to include KERD data in the KEMIS database, which had begun in January 20004, became more concrete in January 2005. KERD provided a data file that included all test takers' scores, along with data indicating their school, local government, and gender. Using this information and working with ICT staff, we began to match KERD and SPEB school codes, an essential step in being able to use the data in conjunction with one another. Upon examination of the data, it became clear that there is inadequate standardization of KERD school code format, which makes matching and integration difficult to automate, and the presence of many typos showed that the codes were being manually entered.
17. In addition, there are considerable inconsistencies between KERD schools and SPEB schools. A discussion with KERD and SPEB staff identified the following issues:
- a. for schools in SPEB database but not in KERD (i) some of the schools are Islamiyya and Quranic who do not take KSCE Exams but JIS (Junior Islamic Secondary Schools Exams) under the Arabic Islamic Education Department (AIED) of the State Ministry of Education; (ii) some schools are recently established and have not reached the level to write KSCEE (ie Grade 6).
  - b. For schools in KERD database but not in SPEB database: (i) some private schools are registered with KERD but until this year SPEB has not collected information on them; (ii) some schools are just missing, apparently due to data entry errors.
18. Having identified the errors, SPEB and KERD are undertaking the following action: (i) SPEB, KERD and MoE have agreed to adopt one code – the code furnished by the Federal EMIS; (ii) SPEB will include all private schools in 2004/2005 data collection and coding; (iii) discussions have begun to negotiate with AIED to allow release of their data to be included in the database – but this will be a long and politically sensitive discussion. Finally, KERD have agreed to assign a school code (as opposed to an examination center code) to every child taking the KSCEE.
19. For the current year, KERD was provided with a list of school codes by the SPEB in June 2005. KERD delayed their own data-entry pending receipt of this finalized list. As a result, by close of project, KERD had yet to provide the exported data required to enable integration into KEMIS. After considerable review, it was decided that the data provided by KERD for 2003/2004 contained too many difficulties for it to be useful. The intention had been to aggregate student data by school to establish a “school achievement score”. However, a

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combination of missing schools, and the practice of KERD allocating pupils by examination center where the test was taken rather than school of origin, mitigated against establishing reliable information.

20. Explore option of integrating Junior Secondary Data. The Junior Secondary School census questionnaires were collected from the State Ministry of Education (SMoE) and reviewed by the database developers. Whilst there is some overlap in census questions between the primary and secondary school census, the design and shape of the JSS questionnaire is still under review by the State Ministry of Education, which is considering including information from the Federal census form.
21. In addition, further discussion with SMoE suggests that there is no data to import. Electronic databases were not found on any of the 4 computers in the PRS of the SMoE nor was data collected and entered on behalf of the Federal Ministry of Education located. All census data would therefore need to be re-entered into a SPEB database rather than “integrated” or migrated from one database to another.
22. We therefore propose deferring expansion of the EMIS database to include JSS pending (i) clarification of redesigned national census forms; (ii) availability of data electronically; and (iii) resolution of uncertainty surrounding the location and administrative responsibility for managing a combined database.
23. Enhance interface of existing Personnel Emoluments Tool. Support for Kano SPEB’s Personnel Management System was proposed in the original work-plan, as an example of one ancillary system that could benefit from further EMIS development. In August 2004, RTI consultant Martin Gustafsson traveled to Kano and worked with three Kano SPEB staff members on the development of an Excel-based budgeting tool. This tool extracted personnel data from the EMIS, processed it in an intermediary Access database, and used the resulting data to populate the Excel tool. Although the tool was completed after Mr. Gustafsson’s departure, the basic design was established jointly with the Kano SPEB staff. Moreover, training of the three staff members occurred in order to create capacity within Kano SPEB for the further development of the budgeting tool, and other, similar tools. This initial tool, version 1.0, enabled budget projections to be made based on current employees’ age, qualifications, dates of first and current appointments, salary and step, and policy and administrative decisions such as promoting teachers, modifying allowances, and changing salary grades for certain groups of the teaching
24. In June 2005 modifications were made to the tools, both to the Excel budget tool and to the Access database that was being used to prepare EMIS data. With the addition to the EMIS of the querying power of Crystal Reports, the transformations and reporting that the previous Access database conducted on the data were no longer needed. At the same time, SPEB requested RTI’s help in designing a Personnel Management Tool to track its employees from one month to the next, which would become part of their payroll administration. Accordingly, the previous Access database was eliminated, its function replaced by Crystal Reports, and at the same time a new Access database developed to

manage personnel. These are currently referred to as the Budgeting Tool and the Personnel Management Tool.

25. The Personnel Management Tool (PMT), an Access database, takes personnel data from the Kano SPEB EMIS, on an annual basis after census data has been entered, and houses it in a management database. Whereas the census data contained in the EMIS is “frozen”, representing the situation for a given moment in time, the data in the PMT is “live”, can be updated on a monthly basis so as to reflect the most current situation at any given moment. Included in the PMT are SPEB Headquarters and Zonal staff, as well as LGEA staff. This SPEB staff data must be entered manually on an annual basis, but is included in reports which capture total education personnel emoluments.
26. The Crystal Reports interface of the Kano SPEB EMIS uses the PMT data to generate reports on a monthly basis which detail personnel emolument data on a school-by-school and LGEA-by-LGEA basis. These reports should be sent to LGEAs each month, where they are reviewed and corrections and updates sent back to SPEB for entry into the PMT. This PMT data is also used to populate the budget tool.
27. Version 1.1 of the Budgeting Tool produces a printable report in Excel (the sheet Report of the file Budget tool 1.1.xls) covering personnel expenditure and headcount details, by LGEA, relevant to the current year and the next financial year. This report indicates on what decisions the report is based (these decisions can easily be changed to create alternative scenarios). The report is intended to be used to inform management of the personnel expenditure situation.
28. RTI developed a User and Developer Handbook for these two tools. The guide, updated to reflect all improvements to the tools, explains the process by which data is imported, managed, and exported from the PMT. It also details the inner workings of the Excel-based budget tool so that users may modify the formulas should the need arise.

### ***Identify strategies to address future database revisions***

29. Staff training. Training in SQL report queries was provided to staff in the information center during January and February. Three IT staff (Mujitaba Aminu, Nura Adamu and Nura Isa) have participated in regular (almost daily) training. All of them now demonstrate the ability to query the database and retrieve data. The staff prefers to work in pairs. Nura Isa has demonstrated exceptional skill. It is hoped that SPEB finds a way to recognize this talent before they lose it. This issue was raised with SPEB senior management by Herstein during his debrief. SPEB agreed to address the issue but was unable to guarantee a monetary reward.
30. Identify local software developers. David Palacios developed criteria and drafted language for an advertisement seeking Nigerian software firms with the ability to revise the existing database. A half page advertisement was run in three national newspapers for two days. Of a dozen responses, four firms were invited to participate in interviews during David Plotner’s TA in early April.

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31. The firm Integrated Communications Networks was selected. In order to test their abilities, they were contracted to add a new form to the database user interface and adjust the database accordingly. The form was the State and Local Government of origin of the parents of Kano school children. This form has not been added to the database. It was selected for the complexity of design and data allocation processes. ICN produced a first class product and RTI has no reservations in recommending them to make future modifications to the database. Contact information for the firm is available in Annex 2 of the report

### ***Facilitate data transfer between National and Kano EMIS databases***

32. RTI was requested by the Federal Ministry of Education, Education Data Bank, through USAID to assist in the development of software code to enable the Kano education data to be imported into the Federal EMIS database. This request was not originally foreseen in the extension proposal, but was included in the activities to be completed on USAID request.
33. The activity was a 2-step process. First, RTI contracted a software programmer, Mr. Philip Okoroji, currently working under the DfID CUBE initiative to assist the EDB develop national EMIS software. This programmer drafted a script to allocate data into the fields of the national software. RTI then developed code to extract data from the KEMIS database into a file that and format that was readable by the first code. A button was added to the KEMIS user interface to create the export file required to be sent to the EDB. During the process, it was noted that the EDB requested a number of fields not available from the Kano database, mostly related to specifics on PTA composition, GIS location, child health and boarding facilities (which is relevant for secondary schools only).

## **Capacity Building for Information Use**

### ***Provide Staff-specific computer training***

34. Training of IC staff. RTI local consultant, Emeka Ogasi, has continued to provide training to SPEB staff. In addition to SQL training, the staff has received additional training in Visual Basic, Access and Excel. However, it has proven difficult to hold training without interruptions as work is assigned to those in training or they are called out of training to perform other duties. As a result, attention is usually divided and what has been covered must be revisited to confirm understanding.
35. Training of senior management staff. Mr. Ogasi held meetings with Board Chairman, Secretary and Department Directors to determine their availability, current knowledge of computers and arranging training schedules. He installed a typing tutor and computer based training kit for Windows for those with personal computers to allow them to practice when free so to do (Legal Office, USAID Coordinator, PRO and Director School Services). He has provided training manuals and started training in introduction to Windows, MS Word, Internet Usage, MS Excel and Power Point. However, a combination of low starting

knowledge, the pressure of duties and participation in the Hajj limited the total amount of training provided.

36. The limited participation of senior staff in training has been the single most significant failure of SPEB development. Although both the Chairman and Secretary of the Primary Education Board did make themselves available, it was never on a consistent basis and the pressures of work prevent them from maximizing the training. The Chairman even returned his computer to the Information Center. Some mid-management staff expressed interest in training and made themselves available. However, they did not have access to the computers. Future IT-based activities may wish to consider advising on a more needs-based allocation of available computers.

***Provide training guides and software support documentation***

37. Recognizing that staff turnover is inevitable, in December 2004, RTI provided KANO SPEB with a self-directed guide to the database. This user guide has been updated to cover installation of Crystal Reports/Crystal Server and to include information about new features or procedures including
  - a. “Correcting Editing forms marked as complete”.
  - b. New procedure and module to create new academic years
  - c. System backup and recovery
  - d. Use of scripts for creating the database for reporting purposes.
38. In response to feedback from the ICT staff, an interactive installation CD was also created which provides the user with all software (license free), scripts and instructions needed to run the EMIS. The CD also includes interactive tutorials on system use that complement the information on the user guide. These tutorials run using any windows based media player, a function that ICT staff found much easier to follow than written text.



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### ***Create demand for information through census questionnaire review***

39. Two workshops were held in January: one for SPEB staff and senior managers and representatives from other State Ministries; a second for zonal and local government education officers, and LG council members, NUT, PTA and other civil society representatives. These workshops led to significant changes in the census questionnaire (as described in para 7). Amongst the most vocal of these groups in terms of additions and refinement to the previous year's census were the PTA members, who raised several issues that led to changes in the form. Most notably, they raised the issue (heretofore un-raised) of teachers assigned to a primary school but seconded to a JSS school. As a result, the census form was modified to capture this data
40. In addition, the information center has been receiving an increased number of requests for data from within and outside the SPEB. Examples include, (i) personnel department asking for data on staff due for promotion and those due for retirement in 2005; (ii) schools services using information as basis to distribute educational materials especially text books distributed in March using EMIS data; (iii) a board member requesting school reports for Dawakin Kudu LGEA to respond to questions from that constituency; (iv) the LGC Chairmen of Minjibir and Fagge requesting information on infrastructure in their local governments; and (v) Federal College of Education requested for teachers with NCE and above in Sciences; (vi) Private schools Association Chairman requesting the list of schools and their achievement data; (vii) Director of Nomadic Schools requesting enrollment by gender and LGEA in nomadic schools. This wide variety of requests demonstrates the interest in the data being providing by the KEMIS. Nevertheless, the SPEB needs to be more pro-active in supplying data rather than waiting for requests.

### ***Support SPEB-initiated activities for information decentralization***

41. Stakeholder workshops. Two activities were undertaken in June 2005 to promote dissemination of information products. First ,the LGEA Education Secrtearies, Head of Section PRS and Chairman LG PTA were invited to a meeting where (i) the revised school lists with updated codes were distributed; (ii) basic summary data on all schools in an LGEA was discussed; (iii) school by school teacher lists from the PMT were provided to Education Secretaries for review.
42. Unfortunately, it was during this meeting that it was recognized that some 600 schools were missing from the database since during the meeting Education Secretaries immediately called attention to missing schools. However, the teacher lists were complete, although in discussion, many LGs claimed to have recruited additional teachers since the census in February. Suspecting ghost teachers, the SPEB has decided to compare the projected payroll per LG, using the census returns on teachers per school, with the monthly payroll requested by the LGEA, to assess the possible budget inflation. It is not clear at this point whether the SPEB will pursue this.

43. A further interesting development from the forum was the discussion that surrounded one LG declaring that 20 additional schools had been opened since February. Many other Education Secretaries questioned on what basis the schools had been opened, and whether any reference had been made to statistics. Even the PTA Chairman from that particular LG was unaware of the decision. This heightened the discussion around the political interference in the education system, demonstrated that many Education Secretaries appreciated that the data could be a useful tool for planning and lobbying for appropriate construction activities within their jurisdiction.
44. The second stakeholder workshop was a dissemination of the revised information products to a broader audience of potential information users. In attendance were the State Minister of Education, representation from the Federal Ministry of Education (Data Bank Director), representatives from the media, LG representatives (including chairmen and PTA representatives), Chairman of the Zakat Commission and other clerical leaders (interested in the information of Islamiyya and Quranic schools), as well as USAID and other donors. The workshop disseminated samples of the various reports now produced from the KEMIS, and encouraged participants to request information from the system. See Annex 3 for list of participants and separate power point for presentation.
45. Develop a Schools Supervision report. In response to the Deputy Director School Services' interest in using EMIS data to facilitate and enhance the school inspection process, the resident manager held meetings with School Services and M&E staff to review their existing school monitoring forms, identify information which could be automatically populated from the EMIS, and add additional information. The revised form has been included as a specific report that can be produced from KEMIS at the press of a button. It is expected that school inspections will cease to be an opportunity only to collect data, and can become an opportunity to collect and verify data. School inspectors can request from DPRS inspection forms for schools they plan to visit (and can select the schools based on any criteria they wish). Those schools' data will be used to pre-print an inspection form. During the inspection the inspectors can add to the data on the form and can verify what was provided during the census. Upon returning to SPEB, data can be updated based on these visits. This system will also provide an opportunity to ensure that all schools are visited on a more regular basis, by using the "Date of last inspection" field as a criterion in selecting schools to inspect.

### **SPEB contributions**

46. Although funds earmarked for EMIS activities continue to prove problematic to access, SPEB has nevertheless increased allocations and funding to EMIS. Specifically, SPEB has budgeted for and funded: (i) the cost of training all HTs in the new census form in January 2005; (ii) radio announcements to declare a class-free day on the day of the census; (iii) the cost of printing sufficient questionnaires and guides for all private schools as well as public schools in duplicate; (iv) data verification; (v) incentives for IC staff to enter data (above and beyond over-time payments); (vi) continued radio programs to discuss the results

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- of the 2003/2004 census; (vii) paper and toner costs for dissemination of reports back to Local Governments and workshop presentations.
47. SPEB continues to implement aspects of the sustainability plan that were agreed; SPEB staff remain consistently engaged, as exemplified by the ongoing discussions to resolve discrepancies in school lists between KERD and SPEB.
  48. Unfortunately, SPEB has yet to recruit candidates to fill the two research positions with PRS. And the officer allocated as the USAID representative, who was a strong proponent of EMIS, has been recruited by the USAID-funded COMPASS project.

## Conclusion

49. Successes. The process by which the revision of the census questionnaire successfully incorporated the concerns of the stakeholders represents a model for future EMIS development and has demonstrated that when stakeholder information and reporting needs are taken into account, greater use is made of the data for objective decision-making. The census guide was completed and was useful in both refining the census questions and guiding school staff. The technical recoding of the database, both the interface and data storage, was completed on time as anticipated, with significant improvements in internal verification structures that improved data quality. The new reporting structure provides a wider array of reports with greater variables. IC staff has demonstrated increased competence in manipulating the database beyond the pre-programmed reports. In addition, a firm competent to make future modifications to the database has been identified. There is demonstrated increased demand for information and clear use in policy decisions, such as resource allocations and in advocacy and budget reviews at LG level.



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***Annex A: Deliverables Status—Jan-Jun 2005***

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Deliverable	Status
Revised reporting system	Completed
• Revised navigation system	Completed
• Revised data entry fields to reflect changes in census questionnaire	Completed
• Integrate KERD achievement data	Pending KERD supply of data
• Revised interface for personnel management tool	Completed
• Revised census questionnaire	Completed
• Census questionnaire completion guide	Completed
• 4 information center personnel capable of queries in MySQL	Completed
• 4 Directors and 4 Deputy Directors capable in Windows environment	Partially completed
• Criteria for individual or firm to provide post-project programming support services identified	Completed
• 3 workshops on data interpretation (LGEA, stakeholders, SPEB staff)	Completed

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## ***Annex B: Data Programming Firm: Contact Information***

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## ***Annex C: Recommendations for Post-KEMIS Activities***

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**Education Management and Information System**  
**Capacity Building and Information Use**  
**State of Kano, Nigeria**  
***Recommendations for***  
***Additional Activities***

*Submitted by*

*Alastair Rodd*

*RTI*

Cooperative Agreement number: 620-A-00-04-00028-00  
RTI project number: 09047  
CTO: Ms. Ann Oden

## Introduction

From December 2003 to June 2005, RTI assisted the Kano State Primary Education Board to develop an Education Management Information System. Although the development of a data storage, retrieval and reporting system is the most visible product of this support, significant effort was allocated to the identification of stakeholders, discussion of the variety of reporting needs, data analysis and the use of information in decision-making. As a result of the dialogue and discussion of the data, additional reporting needs were identified and the census questionnaire and data capture system adjusted accordingly.

As users begin to understand the capabilities of the system, their demands for information also increase and shift. New policy issues are identified and require more in depth exploration to better understand the ramifications. The development of EMIS is therefore an iterative and ongoing process in response to the users' demands.

In December 2004, RTI left SUBEB an annual work-plan that provides guidance on the activities to be budgeted for the data collection, capture and dissemination process. This document complements that work-plan and provides guidance to the SUBEB and other interested parties with respect to (i) data collection and reporting issues; (ii) database management and maintenance; and (iii) database upgrade options. Most of the issues raised were either beyond the remit of the KEMIS project, or arose as a result of the activities, but time would not allow for full implementation.

The passing into law of UBE has led to the creation of State Universal Basic Education Board (SUBEB), which supersedes the State Primary Education Board. With SUBEB has come a new management team. Neither the new Chairman, nor the new Secretary, have been associated closely with KEMIS. It is hoped that either USAID, existing DPRS or COMPASS staff can take the initiative and introduce the new management to the diversity of EMIS products available. For EMIS to survive, the political support and active use of the product by senior management is essential.

## Data Collection and Reporting

Significant improvements in the data collection and reporting process were achieved over the course of the two years, but continued support in several areas is still required.

***Master School List***

Considerable effort and resources were allocated to creating a school list that captured all public and private primary schools, including Qur'anic and Islamiyya schools. The list allocates a separate unique identification number to every establishment, even when two schools are operating in the same physical location but at different times of day. To ensure the completeness of the list, it was circulated to each Local Government and to the Private Schools Association. All the schools have been added to the database

In order to maintain this list, a Master File was created on an Excel spreadsheet. It is absolutely essential that any further revisions that are made are captured on this Master File and **this file alone**. All other files with school lists should be removed from the system.

This file should be distributed to KERD, SMoE and FMoE and be recognized as the list containing the unique code identifier for each school. This unique code identifier should be used by all institutions as the common reference identifier in all databases.

As UBE is introduced, junior secondary schools (or UBE7-9) should be added to the list with a unique reference number allocated (unless a primary school extends access at the same physical location to UBE7-9).

***UBE/Junior Secondary Schools***

The legalization and gradual implementation of UBE will have implications for the collection and reporting of school data. Depending on decisions to merge schools, convert primary schools to feeder schools or extension of existing primary schools, additional data will need to be collected. This will later the specifications of the EMIS data capture form and database. A decision should be made soon as to whether a single form for UBE1-9 or 2 separate forms to capture data from primary and JSS should be implemented. This decision is dependent on the political decision of how to re-organize existing schools to meet UBE access requirements. If the decision is to extend the physical capacity of existing primary schools, then a single form may be most appropriate. If existing JSS are converted to UBE7-9, and the teaching structure remains with a diversified curriculum and subject specialist teachers, a second supplementary form may be required. Either approach will require revisions to the data capture system.

***KERD/Pupil Achievement Data***

Initial agreement was reached with KERD to (i) share unique school codes; (ii) for KERD to collect achievement information on the basis of schools that pupils attended rather than examinations centers where SCEE was sat; (iii) supply to SUBEB with achievement data in the following format:



School Code	LGA	Zone	Total Test Takers	Total M	Total F	M Maths	F Maths	Englis Avg	M Eng	F Eng	Hausa Avg	M Hausa	F Hausa	IRK Arabic Avg	M Irk/Ariabic	F IRK Arabic
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SUBEB will provide KERD with the total number of expected P6 candidates.

As of the conclusion of this project, KERD had not provided the data as requested because they had not completed data entry. This data needs to be collected in an Excel spreadsheet and imported into the appropriate fields in the database.

In the process of reaching agreement with KERD, it was established that pupils from Islamiyya schools take an independent examination. A decision must be reached as to whether to use this information in reviewing pupil achievement. This information would allow comparison of pupil performance across Islamiyya schools. However, the SCEE and Islamiyya examination may not be compatible, measuring different content, cognitive and behavioral performance and there is a risk of trying to compare performance between Islamiyya and Government public schools using pupil performance on the disparate exams.

A decision is required as to whether to include the Islamiyya exam. If the decision is to request pupil performance then a similar modality as with KERD should be discussed. Finally presentation of the reports will need to be revised.

### ***Personnel Management Tool***

The tool now allows a series of reports that presents teachers, their grade level, appointment status and salary by school. A policy and administrative procedures must be created for distributing reports to LGEAs, collecting changes, ensuring validity (here, involve M&E/School Inspection unit) and using the information to improve teacher recruitment and transfer decisions (in addition to selection for training and promotion). The procedures should be specific enough to include regular timelines (e.g. report sent to LGEAs on 3rd of each month, must be returned by 17th of each month...).

To maximize this tool, the Information and Computer Center must make one staff member available to enter any corrections sent back by the LGEAs each month.

The reference tables in the PMT must be maintained on a regular basis, so that changes in salary schedules, allowances are updated immediately they are announced.

Data for LGEA, SUBEB, Zonal and SUBEB HQ staff have been incorporated in the PMT. Separate requests must be made to ensure this information is up to date.

There should only be one “master” file. This file should have a specific file location with restricted access. The file should be backed-up at the end of every month after corrections have been made.

Resources will need to be made available to cover the recurrent costs of sending this information to the LGEAs each month. The most significant costs are (i) the paper (approximately 10 reams each month); and (ii) the printer cartridge/ink (4 per year). In addition, regular maintenance of the printer is recommended.

### ***Reporting***

A variety of additional reports and variables have been added to the database. Additional support and training will need to be programmed for different categories of user (SUBEB staff, Zonal officers, LGEA staff, politicians, community groups, PTA) to ensure there is full understanding of the indicators and implications of the reports.

An immediate concern is to distribute to LGEAs the updated reports and graphs from the February census.

The SUBEB undertook an important initiative to discuss the results of the database and the reports on the radio, with a new topic and data presented each week. This innovative and successful activity should be continued.

### ***Data collection***

The next census is just around the corner (February 2006). Additional budget will be required to print forms for the private schools; more data is being generated increasing the data entry workload; and more reports will require additional paper and ink. SUBEB should plan now for these activities NOW.

In particular, the SUBEB must make a decision with respect to data entry. KEMIS supported rapid data entry by contracting additional data entry clerks and providing incentive payments to existing ICT staff. SUBEB should consider a similar policy to ensure data is entered in a timely and reliable manner.

KEMIS also paid for fuel for the generator and routine maintenance of the desk tops. These were not significant expenses, but vital to the smooth operation of the Information center. There is no evidence as of the end of project that SUBEB has budgeted for or released funds for these activities.

### ***Data Quality***

The project realized significant improvements in the quality of the data reported from the first to the second census. Nevertheless, significant quality gaps remain, as evidenced by anomalies that present themselves in the reports.

SUBEB should concentrate on three areas to improve data quality: (i) the Monitoring and Evaluation and School Inspection teams should be required to request for a School Supervision form before conducting a school visit. The teams should carry these forms to the schools, note any corrections in reported information and return a copy of the amended form to the Information Center

after the visit. In addition to correcting the database, the IC staff should maintain a log of the corrections and identify trends or consistent areas that need correction. This can inform the content of the annual census preparation discussions with LGEA staff; (ii) data verification has been undertaken after each census. The verification has been conducted systematically, and the results have informed changes in the content and presentation of the data census form. However, the results of the verification have not been applied to the database. Nor have the results informed training for the LGEA staff; (iii) analyze specific questions to reveal reporting error. For example, response to the question on pupil attendance was consistently poor. It appears that the HTs did not fully understand what was required of the question. Appropriate changes can be made in the census instructions.

School record keeping remains weak. PTAs can be requested to volunteer to assist schools with the regular completion of records, especially in large urban schools. In rural areas, many schools were not issued with the record books. Review of the record book distribution policy with LGEAs should be undertaken.

## Database Management and Maintenance

### Server clean-up and memory management

Due to the memory and disk space requirements of the EMIS application, it is crucial for the good operation of the system to have enough memory and disk space on the server. Recently the use of the server for other purposes was taking up part of the memory and disk space and was causing problems on EMIS operation.

A set of recommendations are included on the User Guide about this issue, including controlled access to the server, removal of unauthorized applications, regular back ups and defragmentation.

IC staff should read the USER Guide and apply the recommendations therein.

### Server and UPS

The current UPS supporting the server cannot operate appropriately with the existing fuel generator used when there is a power outage. Although it performs satisfactorily before making the change to generator power, it is recommended that SUBEB purchases a new UPS ensuring that it can operate correctly with the existing generator.

The SUBEB must maintain the virus software protecting the server, including the license on the firewall. Frequent use of the internet and personal CDs and

diskettes on networked computers ensures that the current risk of virus infection is high.

### **Security Access**

The network was established to enable different levels of access to the database. Administrators have full access, IT staff have access to enter data, and other networked SPEB staff (such as the Chairman and Directors) can view reports, but make no changes. However, to date no info user accounts have been established. Currently all IC staff log on as administrators. To preserve the confidentiality of staff records and the integrity of the data, the proposed security access protocols that have been repeatedly recommended should be applied.

## **Database Upgrade Options**

### ***Separating the EMIS interface to show one year at a time:***

The volume of data collected on the EMIS is considerable with approximately 250MB to 300MB yearly size increase of the NIGWEB database. NIGWEB's size has an impact on the response time of the interface for data collection in the EMIS (not necessarily on the reporting module since it works from a different database). The database size also impacts memory use when the EMIS interface displays data since more and more information is being loaded into memory.

Due to the independence of data entry activities and the academic period it should be possible to split NIGWEB into several different databases including data for a single period of data collection. The intention of this change is to improve database performance and memory use by working with smaller databases. These changes will mean work on three fronts: a) NIGWEB database, b) nigeriaP context on the Tomcat server and c) scripts to create NIGWEBv2.

A detailed description of these changes has been provided on the User Guide.

### ***Migrating the EMIS to SQL Server:***

Even though MySQL Server Database has proved to be a very efficient and fast database that has coped with the increase of database size, a benchmark of the system performance with the EMIS running on top of a different database engine was never done.

Due to the EMIS architecture and the use of Hibernate, migrating the application to run over a different database engine is a possibility. It could be convenient at a certain point to try the migration and compare system performance versus the MySQL based EMIS.

If a better performance is observed the strategy of splitting the database into smaller pieces might not be necessary. Instructions on how to implement the migration of the EMIS to MS SQL Server has also been included on the User Guide.

## Policy Implications

The SPEB has yet to recruit additional researchers to the PRS department as suggested. However, a number of issues emerged from the preliminary reports that require further analysis of the data and can contribute to some immediate policy decisions to address quality and access issues in Kano.

### UBE

The implementation of UBE will require a number of policy decisions surrounding the organization of schooling. SUBEB will need to decide whether to offer UBE 7-9 classes in existing schools, in feeder schools or in existing JSS structures, or a combination of the above. KEMIS provides a wealth of information on the enrollment, and project P6 output from public and private primary schools. The USAID-funded LEAP project collected the geographic location of 80% of these schools. With a little additional effort, the location of the remaining schools and that of JSS schools can be mapped. This information can then be used to estimate the facility needs (over five years) to accommodate all children in Grades 7-9 as UBE requires.

### Girls' Enrollment

One of the significant impediments to achieving EFA and MDG goals in Kano is the lower participation of girls in primary school. However, data collected during the census suggests that, in rural areas in particular, more girls enroll in Islamiyya schools than in "secular" Government schools. Yet the number of such schools in rural areas remains low. Further research should be directed to review the implications of expanding access to Islamiyya medium education in rural areas.

### Teachers

Training: The proportion and distribution of unqualified teachers (meaning NCE and above) is cause for immediate concern. A targeted strategy must be developed to address the continued recruitment of unqualified teachers on the basis of political expediency and favoritism. KEMIS reports now also allow an analysis of the distribution of teachers selected for qualification upgrade and the courses for which they register. These reports can be used to better align selection to geographic and subject needs.

Secondment: There is a high proportion of teachers on secondment to secondary school or LGEA administration (over 10% of all teachers). These teachers are paid from the LGA budget. This may be less of an issue with SUBEB. Nevertheless, this distorts the numbers of teachers available for teaching.

### **Access to Latrines**

Review of the latrine reports suggest that access to sanitary facilities is appalling. A key factor in girl child enrollment is access to appropriate sanitary facilities

### **Resource Distribution**

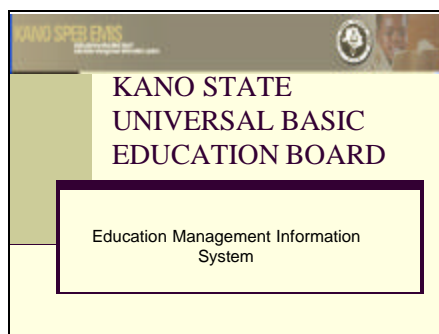
Year on year data allows for comparison in resource allocation. Two issues emerge from the data. First, infrastructure needs appear to be met by the creation of new 2- or 3-classroom schools when expansion of existing schools would be a more efficient approach to increasing access. Second, the numbers of reported available books and furniture do not always reflect the numbers reported as distributed. A number of factors could account for these differences, ranging from poor data reporting and capture, resource misallocation and resource misappropriation (particularly common is for benches to migrate into village houses). Again specific research on a sample of schools might provide clues as to strategies to ensure that the limited resources that are available are maximized.

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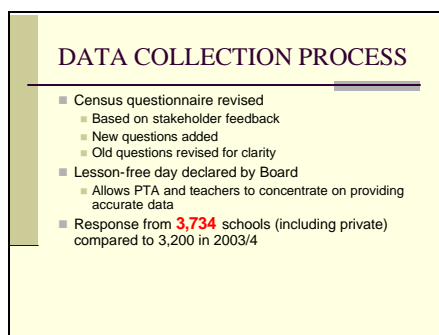
***Annex D:      Presentation of KEMIS Products***  
***June 27, 2005***

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## Slide 1



## Slide 2



DESCRIBE THE DATA COLLECTION PROCESS; EMPHASIZE THE PARTICIPATION OF LGEA STAFF AND STAKEHOLDERS

INNOVATION OF LESSON FREE DAY ENABLED HEAD MASTER AND TEACHER TO PREPARE THEIR RECORDS WELL

EXCELLENT RESPONSE – HAS LED TO A DEFINITIVE LIST OF SCHOOLS, WITH CODES FOR THE FMOE DATABASE

FIRST STATE TO SEND DATA ELECTRONICALLY TO FEDERAL MINISTRY

WILL HELP IN PLANNING UBE



## Slide 3

### DATA ENTRY AND VERIFICATION

- SUBEB sampled 5% of schools across State
- Findings
  - Improved accuracy over 2003/4 census
  - High non-response from private schools
- Data entry hindered by fluctuation of power
  - Data lost
  - Hardware and software damaged

DATA VERIFICATION – PHYSICALLY VISITED 4 SCHOOLS IN EACH LOCAL GOVERNMENT TO CONFIRM ACCURACY OF DATA SUPPLIED

PROBLEMS WITH DATA CAPTURE. UNFORTUNATE THAT 555 SCHOOLS WERE LOST.

WE ARE RE-ENTERING DATA NOW

## Slide 4

### REPORTING

- Variety of reports available for State, by Zone, by LG and by individual school
- Reports allow year on year comparison
- Reports allow Secular, Islamiyya and Qur'anic schools to be separated and compared
- Graphs for general audience (big picture)
- Tables for administrators, planners (details)

REPORTING OF EMIS IS DESIGNED TO BE VERSATILE

REPORTS FOR EACH LEVEL DESIGNED FOR DIFFERENT USERS

REPORTS ALLOW DATA TO BE COMPARED WITH LAST YEAR. HOWEVER, LAST YEAR DATA WAS LESS ACCURATE AND SO COMPARISONS THIS YEAR ARE LESS USEFUL. NEXT YEAR THIS WILL BE AN IMPORTANT FUNCTION

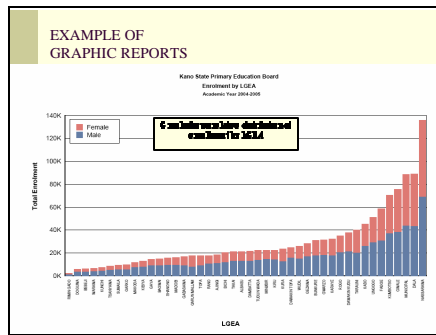
REPORTS ALLOW INFORMATION TO BE SELECTED FOR PUBLIC OR PRIVATE SCHOOLS

REPORTS ALLOW ISLAMIYYA AND QUR'ANIC SCHOOLS TO BE VIEWED SEPARATELY – IMPORTANT FOR POLICY DECISIONS

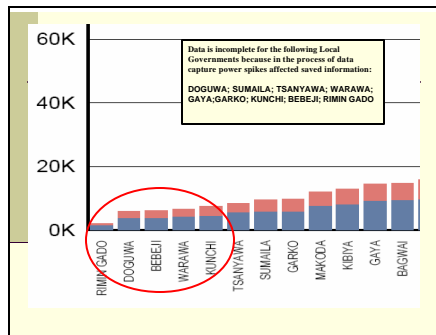
TWO TYPE OD REPORTS; GRAPHIC PRESENTATION PROVIDES SUMMARY SNAPSHOT FOR POLICY MAKERS AND GENERAL PUBLIC

TABLES PROVIDE DETAILED INFORMATION FOR PLANNERS, ADMINISTRATORS

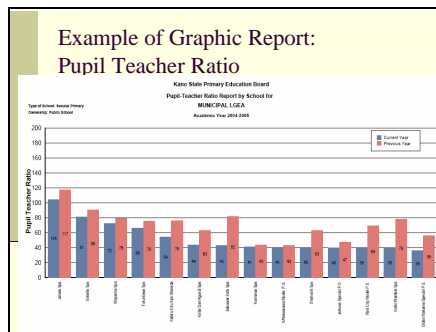
Slide 5



Slide 6



Slide 7



# SUPERVISION REPORT

Kant State Primary Education Board  
Inspection Report Form

Current inspection Date: \_\_\_\_\_  
Year: \_\_\_\_\_

**A. General Data:**

School: KANT PRIMARY SCHOOL,  
Type of Institution: GOVT  
Year Established: 1975  
LGA: \_\_\_\_\_ Location: KAT  
Date of last inspection by KSEB: \_\_\_\_\_

**B. National Inspection**

At Board Headquarters: 5/1/2024  
At Head Office: \_\_\_\_\_  
At Local Office: 3/6/2024  
At Other (Specify): \_\_\_\_\_

**C. School Information and Observation**

Sl. No.	Class	General				Subject Observation			
		Performance	Engagement	Attitude	Participation	Topic	Style	Length	Relevance
1	BBSS	2	3	3	3				
2	BBSS	2	3	3	3				
3	BBSS	2	3	3	3				
4	BBSS	2	3	3	3				
5	BBSS	2	3	3	3				
6	BBSS	2	3	3	3				
7	BBSS	2	3	3	3				
8	BBSS	2	3	3	3				
9	BBSS	2	3	3	3				
10	BBSS	2	3	3	3				
11	BBSS	2	3	3	3				
12	BBSS	2	3	3	3				
13	BBSS	2	3	3	3				
14	BBSS	2	3	3	3				
15	BBSS	2	3	3	3				
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55	BBSS	2	3	3	3				
56	BBSS	2	3	3	3				
57	BBSS	2	3	3	3				
58	BBSS</								

THE TABLE PRESENTS FURNITURE NEEDS IN TWO WAYS – THE FIRST CALCULATES THE NUMBER OF BENCHES TO ACCOMMODATE ALL THE CHILDREN

# DETAILED TABLES

## Slide 10

Reports identify :

Type of school (all, secular, Islamiyya, qar'ani) **Acad**

Classification (public or private)

LOEA: MUNICIPAL

Type of School: Islamiyya Primary

Ownership: Private School

	Total	Classrooms				
		Good Condition	Needing Repair	Need to match 1st LT	Need to match 2nd LT	Acad
Abdullahi Bayero Isl	11	9	2	3	0	
Abdullahi Isl. Nur & P.S.	9	7	2	1	4	
Abubakar Sawa Isl	5	5	0	1	4	
Adafaiyya Isl.	6	4	2	3	7	
Ado Bayero Hidayatul Adfal Isl	8	6	2	1	3	
Ahmad Ali Islamiyya P.S.	7	9	2	1	9	

EACH REPORT CAN BE FILTERED BY TYPE OF SCHOOL AND BY OWNERSHIP

## Slide 11

Using Information  
Example –Furniture Needs

Kain State	Type of School	Ownership	Total enrollment	3 seater benches	3 seater benches	3 seater benches	3 seater benches	3 seater benches	3 seater benches
				needed	needed	needed	needed	needed	needed
UNION	1000	1000	1000	1000	1000	1000	1000	1000	1000
NASARAWA	1000	1000	1000	1000	1000	1000	1000	1000	1000

Compare Municipal and Nasarawa. Municipal received 3-seater benches from NEBE and USAID last year. Although enrollment has increased, need for 3-seaters has declined. For Nasarawa, enrollment has increased and situation is worse than previous year.

DETAILED REPORTS CAN BE EASILY USED TO SEE IF IMPROVEMENT IS TAKING PLACE

WE KNOW MUNICIPAL LOCAL GOVERNMENT RECEIVED MANY BENCHES FROM THE SPEB AND USAID (THROUGH LEAP) LAST YEAR

THE THREE SEATER BENCH NEED HAS DECLINED, EVEN THOUGH ENROLLMENT HAS INCREASED.

IN CONTRAST THERE HAS BEEN LITTLE IMPROVEMENT IN NASARAWA LOCAL GOVERNMENT

## Slide 12

USING THE INFORMATION  
GENERAL PUBLIC

- Compare
  - status of LGS
  - status of schools in a LG
  - by secular and islamiyya
  - across years
- Advocacy for targeted improvements

SO HOW CAN THIS VARIETY OF REPORTS BE USED BY THE GENERAL PUBLIC? THEY CAN BE USED FOR ADVOCACY FOR SCHOOLS, LOCAL GOVERNMENTS OR EVEN TYPE OF SCHOOL

## Slide 13

**USING THE INFORMATION  
ADMINISTRATORS**

- Rational allocation of scarce resources based on need by LGEA
- Planning and Budget justification
- Monitoring and supervision
- Identify policy issues: for example
  - Gender enrollment by type of school
  - Employment of unqualified teachers

THE INFORMATION IS ALSO IMPORTANT FOR ADMINISTRATORS. LOCAL GOVERNMENT EDUCATION SECRETARIES CAN ALLOCATE RESOURCES AND MANPOWER TO THOSE SCHOOLS WITH GREATEST NEED.

THE INFORMATION CAN BE USED FOR PLANNING AND BUDGETING PURPOSES, DEFENDING REQUESTS FOR FUNDS

MONITORING AND SUPERVISION VISITS CAN BE DIRECTED TO THOSE SCHOOLS WITH THE MOST SIGNIFICANT PROBLEMS

POLICY ISSUES CAN BE MORE EASILY IDENTIFIED AND PRIORITIZED.

## Slide 14

**AVAILABILITY OF REPORTS**

- ALL REPORTS AVAILABLE FROM SUBEB
- IC STAFF CAN PRODUCE SPECIAL REPORTS ON REQUEST
- COMPOSITE REPORT WILL BE AVAILABLE AND DISTRIBUTED TO STAKEHOLDERS AND PARTICIPANTS IN THREE WEEKS

STANDARD REPORTS ARE EASILY AVAILABLE ON REQUEST AND CAN BE QUICKLY SUPPLIED

SPECIAL REQUEST CAN BE ACCOMMODATED, BUT WILL TAKE MORE TIME AS IC STAFF DESIGN AND CREATE THE REPORTS

A COMPOSITE STATE REPORT WILL BE AVAILABLE IN THREE WEEKS WHEN ALL SCHOOLS HAVE BEEN ENTERED